**STATEMENT OF THE CLAIMS**

**Claim 1 (cancelled)**

**Claim 2 (cancelled)**

**Claim 3 (cancelled)**

**Claim 4 (cancelled)**

**Claim 5 (cancelled)**

**Claim 6 (cancelled)**

**Claim 7 (cancelled)**

**Claim 8 (cancelled)**

**Claim 9 (cancelled)**

**Claim 10 (cancelled)**

**Claim 11 (cancelled)**

**Claim 12 (cancelled)**

**Claim 13 (cancelled)**

**Claim 14 (cancelled)**

**Claim 15 (cancelled)**

**Claim 16 (cancelled)**

**Claim 17 (cancelled)**

**Claim 18 (previously presented)** A method ~~for high-shear mixing and reacting of materials~~ comprising:

supplying a first material at a respective first flow rate to a flow path constituted by an interdiffusion passage between two closely spaced stationary surfaces ~~at a respective first flow rate~~;

supplying a second material to the flow path through the interdiffusion passage at a respective second flow rate, to be interdiffused with the first material therein, with resultant material from the interdiffusion and any consequent reaction moving in the flow path at a respective resultant flow rate;

wherein the first material and the second materials each forms a boundary layer against one of the two closely spaced stationary surfaces and after interdiffusion the resultant material ~~resulting~~ from interdiffusion and any consequent reaction of the materials forms boundary layers against both surfaces ~~concomitant with relative movement of the surfaces~~;

wherein the ~~radial~~ spacing between the two surfaces is equal to or less than the back-to-back ~~radial~~ thicknesses of the two boundary layers of material against the two surfaces, and if larger than the back-to-back ~~radial~~ thicknesses with a third layer between the two boundary layers has the third layer too thin to support turbulent convection or to cause channeling; and

wherein the flow rates of the materials in the flow path are great enough to maintain laminar flow~~such that they are subjected to laminar shear of the value required for the interdiffusion~~.

**Claim 19 (previously presented)** Apparatus ~~for high-shear mixing and reacting of materials~~ comprising:

apparatus structure providing two parallel, closely spaced stationary surfaces constituting between them a flow path that is an interdiffusion passage;

means supplying a first material to the flow path through the interdiffusion passage at a respective first flow rate;

means supplying a second material to the flow path through the interdiffusion passage at a respective second flow rate, to be interdiffused with the first material therein, with resultant material from the interdiffusion and any consequent reaction moving in the flow path at a respective resultant flow rate and wherein the passage further comprises movement of each respective surface;

wherein the first and the second materials, and material resulting from interdiffusion and any consequent reaction of the materials, form respective boundary layers against both surfaces;

wherein the radial spacing between the two surfaces is equal to or less than the back-to-back radial thicknesses of the two boundary layers of the material against the two surfaces, and if larger than the back-to-back radial thicknesses with a third layer between the two boundary layers has the third layer too thin to support turbulent convection or to cause channeling; and

wherein the means supplying the first and second materials supply those materials at flow rates such that the materials in the passage are subjected to laminar shear of the value required for the interdiffusion based in part on the relative movement of the surfaces.

**Claim 20 (Previously Presented)** A method ~~for high shear mixing and reacting of materials~~ comprising:

supplying a first material at a respective first flow rate to a flow path constituted by an interdiffusion passage between two closely spaced stationary surfaces ~~at a respective first flow rate~~;

supplying a second material to the flow path through the interdiffusion passage at a respective second flow rate, to be interdiffused with the first material therein, with resultant material from the interdiffusion and any consequent reaction moving in the flow path at a respective resultant flow rate;

wherein the first material and the second materials each forms a boundary layer against one of the two closely spaced stationary surfaces and after interdiffusion the resultant material ~~resulting~~ from interdiffusion and any consequent reaction of the

materials forms boundary layers against both surfaces ~~concomitant with relative movement of the surfaces~~;

wherein the ~~radial~~ spacing between the two surfaces is equal to or less than the back-to-back ~~radial~~ thicknesses of the two boundary layers of material against the two surfaces, and if larger than the back-to-back ~~radial~~ thicknesses with a third layer between the two boundary layers has the third layer too thin to support turbulent convection or to cause channeling; and

wherein the flow rates of the materials in the flow path are such that they are subjected to laminar shear of the value required for the interdiffusion.

**Claim 21 (Original)** The method as claimed in claim 18, wherein the flow rates of the materials are such that their medial linear velocity between the two spaced stationary surfaces is at least 5.0 meters per second.

**Claim 22 (New)** The method as claimed in claim 18, wherein the Reynolds number of each respective flow material is less than the critical Reynolds number for the material.

**Claim 23 (New)** The method as claimed in claim 22, wherein the Reynolds number of each respective flow material is less than 2000.